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Ministry of Health

Aseptic Technique

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2021



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INTRODUCTION

The methods which are used to prevent the access of microorganism during the preparation of parenteral products and their testing are called ‘ Aseptic Techniques’.

Aseptic techniques are used to reduce the risk of post-procedure infections and to minimize the exposure of health care providers to potentially infectious microorganisms.

Aseptic techniques include practices performed just before, during, or after any invasive procedures.



Asepsis



- "The absence of pathogenic organisms or their toxins from the blood or tissues" Wilson J (1995) Infection Control in Clinical Practice. Bailliere Tindall, London
- Difficult to achieve
  - Pathogenic organisms are present in many different areas of the body

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Techniques: definitions

Aseptic	Clean	No touch
• Necessary infection control measures to prevent pathogenic micro-organisms on hands, surfaces or equipment from being introduced into susceptible sites during clinical practice	• A method involving hand decontamination, maintaining a clean environment, clean non-sterile gloves, sterile instruments and prevention of direct contamination of materials and supplies	• A method of manipulation of invasive devices or wounds without directly touching the wound, device, or any surfaces that may come into contact with those sites

Dougherty et al (2010)

Association for Professionals in Infection Control and Epidemiology (2001)

Aseptic Non Touch Technique

Peer reviewed & tested clinical guidelines

- Basic infection prevention & control principles

Aim to standardize & improve the efficacy of the aseptic technique thereby reducing healthcare associated infections

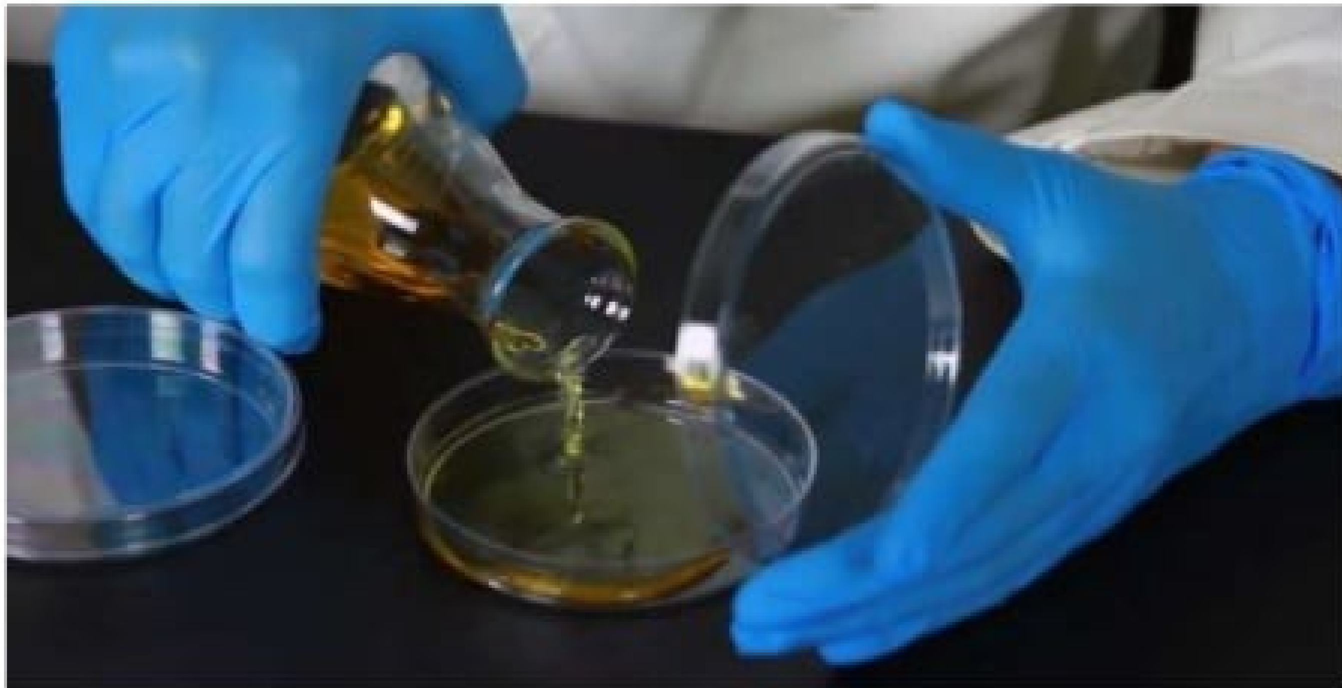
- Standard or Surgical depending on length & complexity of procedure Rowley (1994, 2004)





What is the Aim of Aseptic Technique?

- To prevent the access of micro-organisms during the preparation and testing.



Parenteral nutrition techni

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Standard ANTT

- Technically uncomplicated procedures
- < 20 minutes in length
- Involves small key sites
- Minimal key parts

Surgical ANTT

- Technically complicated procedures
- > 20 minutes in length
- Involves large open key sites
- Large or numerous key sites



Principles are the same. The main difference is the complexity of the aseptic field and how it is managed

Rowley & Clare (2011)

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Good aseptic techniques can only be applied if one knows the possible sources contamination. The various sources of contamination are –

- Atmosphere, which is contaminated with dust, droplet and droplet nuclei becomes the breeding ground of microorganism.
- The hands are a major means of transmitting infection.
- Coughing, sneezing and spitting can cause contamination at a considerable distance.
- The cloths which absorb dust particles are also a source of contamination. A handkerchief is the richest source of contamination.
- The hair, which is constantly exposed to atmospheric dust is source of contamination. These dust particles are liberated from the hair during brushing and shaking of the head.
- The unsterile equipment.
- The working surface.



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GMPs REQUIREMENTS FOR THE MANUFACTURING OF PARENTERAL PRODUCTS ARE

❑ CLEAN AREA CLASSIFICATION

Production of sterile products should be carried out in a clean environment with a limit for the environmental quality of particulate and microbial contamination. Clean areas for the production of sterile products are classified into different grades discussed below –

GRADE	CLASS	≥ 0.5 µm particles/m^3
A	100	3,520
B	1000	35,200
C	10,000	352,000
D	100,000	35,20,000



BUILDINGS & PREMISES

- The building shall be built on proper foundation with standardized materials to avoid cracks in critical areas like aseptic solution preparation, filling and sealing rooms.
- Walls, floors and ceiling should be impervious, non-shedding, non-flaking and non-cracking.
- Flooring should be unbroken and provided with a cove both at the junction between the wall and the floor as well as the wall and ceiling.

EQUIPMENT

The special equipment required for manufacturing parenteral products includes -

- **Component washing machines,**
- **Steam sterilizers,**
- **Dry heat sterilizers,**
- **Membrane filter assemblies,**
- **Manufacturing vessels,**
- **Blenders,**
- **Liquid filling machines,**
- **Powder filling machines,**
- **Sealing and labeling machines,**
- **Vacuum testing chambers,**
- **Inspection machines etc.**



FILTRATION (MEMBRANE)

- Solutions for Large Volume Parenterals shall be filtered through a non-fibre releasing, sterilizing grade cartridge/membrane filter of nominal pore size of 0.22 µ.
- A second filtration using another 0.22 µ sterilizing grade cartridge/membrane filter shall be performed immediately prior to filling.
- Gases coming in contact with the sterile product shall be filtered through two 0.22 µ hydrophobic filters connected in-series.



CONCLUSION

All the aspects mentioned have to be taken into consideration to avoid false positive results and during the comparison it has been found that, all the guidelines focused on high quality requirements for the manufacturing process for sterile pharmaceutical products. All the guidelines were broadly similar except for environmental factors & water system.

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Preparing and administering an IV medication using Standard-ANTT



ANTT™
Aseptic Non Touch Technique

peripheral & central intravenous therapy (preparation & administration)

www.antt.org.uk V9.0

Preparation zone

★Prep patient, expose IV access.

★Check medications


1 **clean hands** with alcohol hand rub or soap & water


2 **clean tray** according to local policy - creating a general aseptic field. Whilst it dries . . . .


3 **gather equipment** place around tray


4 **clean hands** with alcohol hand rub or soap & water


5 **apply non sterile gloves** (use sterile gloves if you must touch key-parts)


6 **open equipment,** prepare IV injections protecting key-parts using non-touch-technique (NTT)

Patients zone

If IV port is exposed and gloves are not contaminated →

If IV port is not exposed and/or gloves are contaminated, clean hands & re-glove →


6a


6b


6c


6d


7 **scrub key parts**

- Using NTT, use a 2% chlorhexidine/70% alcohol wipe.
- Scrub the port tip for total of 20 seconds using different areas of the wipe.
- Then wipe away from the tip.
- Allow to dry for 30 seconds.


8 **administer drugs** using NTT


9 **dispose of sharps** & equipment

Decontamination zone


10 **clean tray** according to local policy


11 **dispose of gloves** then immediately ...

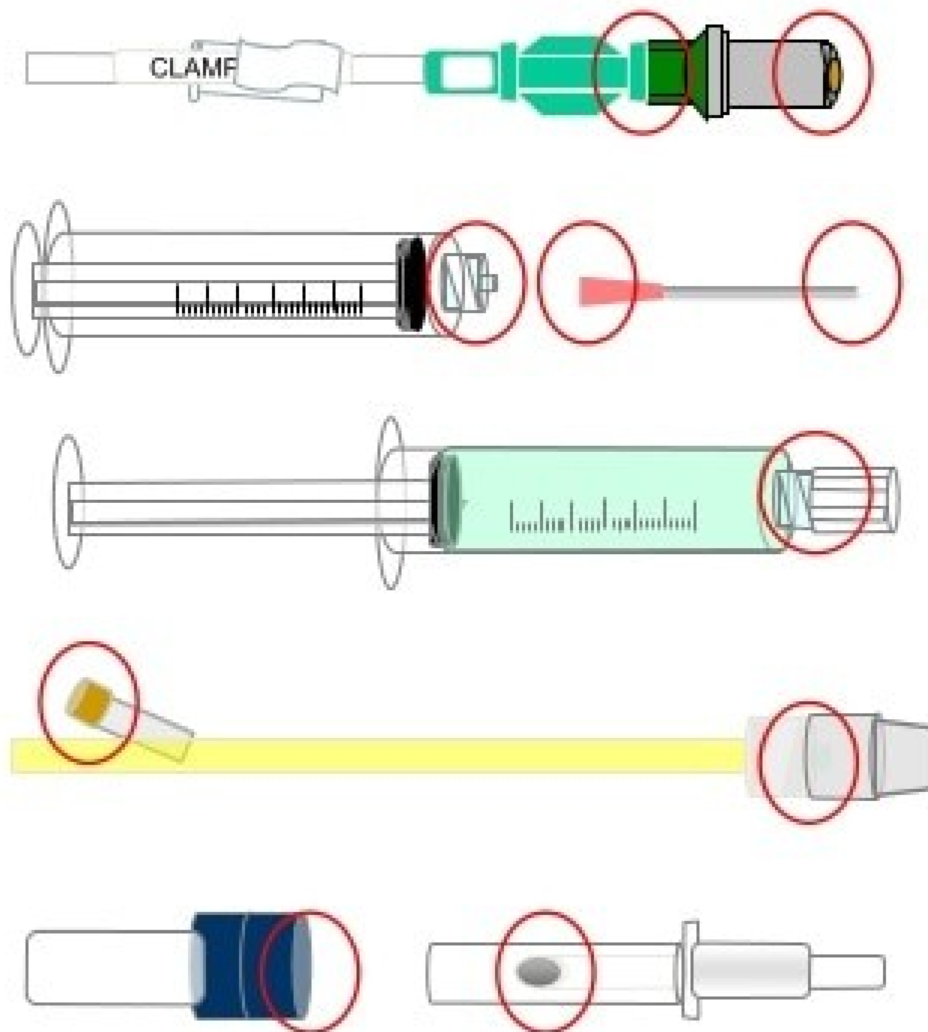

12 **clean hands** with alcohol hand rub or soap & water

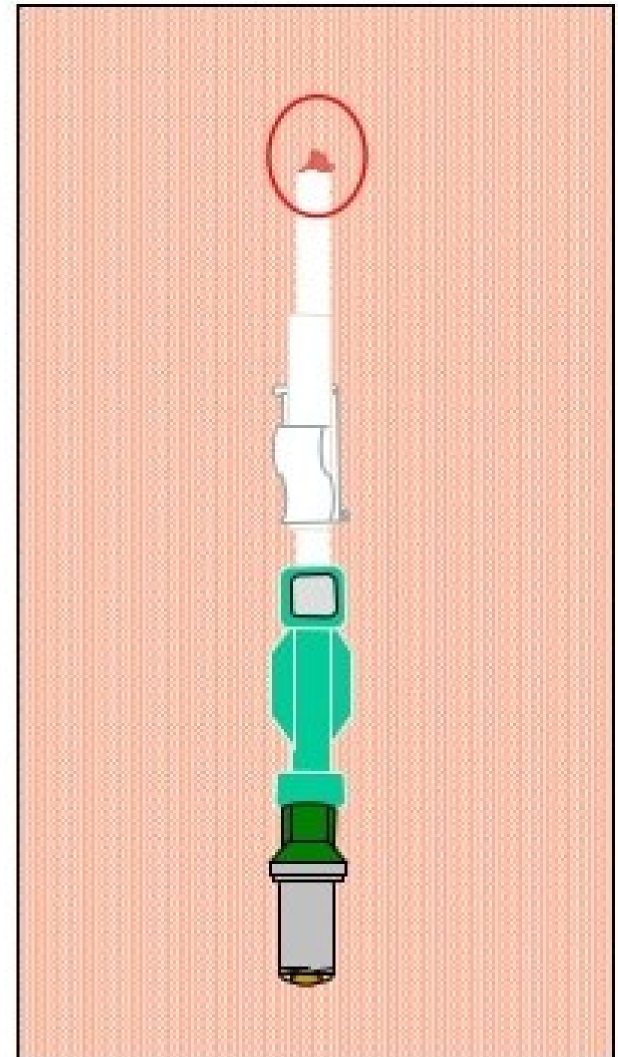
Principles of ANTT

Protect key-parts & sites at all times by:

- Risk assessment.
- Effective hand cleaning.
- A non-touch technique.
- Using appropriate infective precautions.

Type your Hospital or Community name here NHS





Key sites in CVC care





- Do not **DROP** your equipment into your tray

  (There is a risk some Key-Parts will touch the tray)
- Key-Parts should **NEVER** be touched
- Only Key-Parts should touch other Key-Parts



NEVER flick off Key-Parts such as needles or caps

(Your gloved thumb is likely to touch the Key-Part)



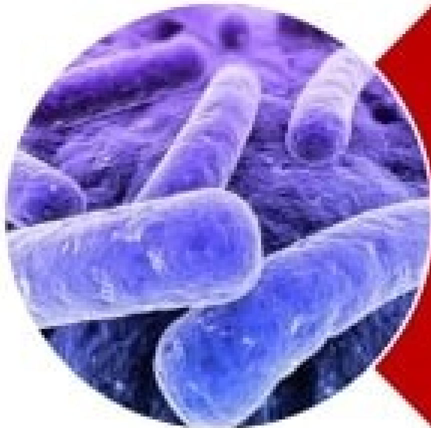
- Don’t do this to identify your drugs (The bungs often leak around the needle making things wet - so no longer aseptic).
- It also increases risk of needle stick injury and would be dangerous if they were to fall out the tray).
- Use labels if you need to identify syringes.

Catheter related infection

2+2=5

- Monitoring catheter related infection is an important outcome measure
- Differences in classifying infection
  - Specifically catheter *related* bloodstream infection (CRBSI) & central line *associated* bloodstream infection (CLABSI)
- Availability of culturing methods, & whether catheter tips are available for analysis make direct comparison of infection rates difficult

The ideal procedure…



Focus on the principles of asepsis rather than a step by step list of instructions



Hospitals should incorporate evidence based recommendations into their procedures

In the microbiology lab we use aseptic technique to:

- Prevent contamination of the specific microorganism we are working with.
- Prevent contamination of the room and personnel with the microorganism we are working with.

SOURCES OF CONTAMINATION

1. The Atmosphere
2. The Breath
3. The Hands
4. . Clothing
5. The Hair
6. The Working Surface
7. Equipment



General Principles of aseptic technique

1. Disinfect the work area before starting to reduce potential contaminants on the bench top, and after work is finished to protect others from possible contamination.



MEDICAL & SURGICAL ASEPSIS

TERMINOLOGY

- Acquired immunity-Host receives natural or artificial antibodies produced by another source.
- Active Immunity -Host produces antibodies in repose to natural (infectious agents) or artificial (I.e. vaccines) antigens
- Antibodies- Immunoglobulin-defend against infections
- Antigens- Substance that induces a state of sensitivity or immune responsiveness (immunity)
- Antiseptics - Inhibit the growth of some microorganisms

- Cross infection- infection transmitted between individuals infected with different pathogenic organisms.
- Carrier- A person who harbours pathogenic organism of a disease in his body without showing signs & symptoms of a disease.
- Droplet infection- It is the infection of individual by means of fine particles of saliva & mucous that are expelled from the nose & mouth of another person during coughing, sneezing or talking.
- Fomites – Objects which have been in contact with a contagious disease are capable of transmitting the disease.

- Medical Asepsis- All practices intended to confine, limit the growth, and transmission of microorganisms; Clean technique
- Asepsis- Freedom from disease-causing microorganisms
- Soiled, contaminated -means likely to contain microorganisms which may be capable of producing disease
- Surgical asepsis - Pracices that keep an area free of all microorganisms
- Sepsis- State of infection
- Septicemia- Systemic infection with bacteria
- Acute infection - Appear suddenly, last a short time

- Disinfectants- Agents that destroy pathogens other than spores
- Infection- Invasion of body tissue by microorganisms & proliferation there
- Disease- Detectable alteration in normal tissue function
- Virulence - Refers to microorganisms ability to produce disease
- Communicable disease - One that can be transmitted to an individual by direct or indirect contact.
- Infection- Entry & Multiplication of disease causing organisms in the body.
- Fumigation – process of disinfection by exposure to the fumes of a vapourised germicide.



Thank you